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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/654,401	09/01/2000	Vladimir Pavlovic	200308306-1	5818

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IP ADMINISTRATION, LEGAL DEPARTMENT
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EXAMINER
DAY, HERNG DER

ART UNIT	PAPER NUMBER
2128	

DATE MAILED: 03/22/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

	Application No.	Applicant(s)
Office Action Summary	09/654,401	PAVLOVIC ET AL.
	Examiner	Art Unit	
	Herng-der Day	2128	

-- *The MAILING DATE of this communication appears on the cover sheet with the correspondence address* --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE <u>3</u> MONTH(S) FROM
THE MAILING DATE OF THIS COMMUNICATION.
- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed
  after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
  Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any
  earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on <u>01 September 2000</u>.

2a)☐ This action is **FINAL**.   2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is
closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) <u>1-74</u> is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) <u>1-74</u> is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☒ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on <u>01 September 2000</u> is/are: a)☐ accepted or b)☒ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All   b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage
application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date <u>12/11/00, 1/31/03, 9/5/03.</u>

4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

1.   Claims 1-74 have been examined and claims 1-74 have been rejected.

Priority

2.   Applicants' claim for domestic priority under 35 U.S.C. 119(e) is acknowledged. The
provisional application number is 60/154,384, filed September 16, 1999.

Drawings

3.   The drawings are objected to for the following reasons. Corrected drawing sheets in
compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid
abandonment of the application. Any amended replacement drawing sheet should include all of
the figures appearing on the immediate prior version of the sheet, even if only one figure is being
amended. The replacement sheet(s) should be labeled "Replacement Sheet" in the page header
(as per 37 CFR 1.84(c)) so as not to obstruct any portion of the drawing figures. If the changes
are not accepted by the Examiner, the Applicants will be notified and informed of any required
corrective action in the next Office action. The objection to the drawings will not be held in
abeyance.

3-1.   It appears that " $\hat{X}_0 \hat{Q}_0$ ", as shown in Fig. 6 should be " $\hat{A}_0 \hat{Q}_0$ ".

3-2.   As shown in Fig. 9, it is unclear why the values both above 0 and below 0 at the Y-axis
are all positive.

3-3. The drawings are objected to as failing to comply with 37 CFR 1.84(p)(5) because they

do not include the following reference sign(s) mentioned in the description:

(a) the state transition matrix 14, as described in lines 3-4 of page 15.

(b) the observation matrix 16, as described in line 4 of page 15.

(c) the switching state synthesis module 412, as described in lines 6-7 of page 49.

(d) the continuous state synthesis module 413, as described in line 9 of page 49.

Abstract

4. The abstract of the disclosure is objected to because it exceeds 150 words in length.

Correction is required. See MPEP § 608.01(b).

Specification

5. The disclosure is objected to because of the following informalities:

Appropriate correction is required.

5-1. It appears that "for $i = 1{:}T{-}1$", as described in line 21 of page 22, should be "for $t = 1{:}T{-}1$".

5-2. It appears that "for $j = 1{:}S$", as described in line 22 of page 22, should be "for $i = 1{:}S$".

5-3. It appears that the right parentheses are missing in lines 1, 3, and 5 of page 24.

Claim Objections

6. Claim 32 is objected to because of the following informalities. Appropriate correction is

required.

6-1. As described in line 1 of claim 32, "The method of Claim <u>32</u>" (Emphasis added), claim 32 depends on itself.

Claim Rejections - 35 USC § 112

7. The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

8. Claim 61 is rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

8-1. Claim 61 recites the limitation "the input sequence" in lines 15-16 of the claim. There is insufficient antecedent basis for this limitation in the claim.

Recommendations

9. For clarification purposes, the Examiner suggests the following replacements in the claims.

9-1. Claim 10 recites the limitation "the optimal control" in line 2 of the claim. The Examiner suggests that "the optimal control" be replaced with "the optimal continuous control".

9-2. Claim 15 recites the limitation "the optimal control" in line 2 of the claim. The Examiner suggests that "the optimal control" be replaced with "the optimal switching control".

9-3. Claim 17 recites the limitation "the optimal controls" in line 2 of the claim. The Examiner suggests that "the optimal controls" be replaced with "the optimal switching and continuous state controls".

9-4.   Claims 18-21 recite the limitation "the sequence of measurements" in line 1 of each

claim. The Examiner suggests that "the sequence of measurements" be replaced with "the

training sequence of measurements".

9-5.   Claim 25 recites the limitation "the at least one sequence" in line 9 of the claim. The

Examiner suggests that "the at least one sequence" be replaced with "the at least one training

sequence".

9-6.   Claim 28 recites the limitation "the dynamic models" in lines 15 and 17-18 of the claim.

For clarification purposes, the Examiner suggests that "program code for associating each

model" in line 3 of the claim be replaced with "program code for associating each of a plurality

of dynamic models".

9-7.   Claim 38 recites the limitation "the optimal control" in line 2 of the claim. The Examiner

suggests that "the optimal control" be replaced with "the optimal continuous control".

9-8.   Claim 43 recites the limitation "the optimal control" in line 2 of the claim. The Examiner

suggests that "the optimal control" be replaced with "the optimal switching control".

9-9.   Claim 45 recites the limitation "the optimal controls" in line 2 of the claim. The

Examiner suggests that "the optimal controls" be replaced with "the optimal switching and

continuous state controls".

9-10.   Claim 53 recites the limitation "the optimal controls" in line 2 of the claim. The

Examiner suggests that "the optimal controls" be replaced with "the optimal switching and

continuous state controls".

9-11. Claim 59 recites the limitation "the optimal controls" in line 2 of the claim. The

Examiner suggests that "the optimal controls" be replaced with "the optimal switching and

continuous state controls".

9-12. Claim 63 recites the limitation "the dynamic models" in lines 13 and 15-16 of the claim.

For clarification purposes, the Examiner suggests that "associates each model with a switching

state" in line 4 of the claim be replaced with "associates each of a plurality of dynamic models

with a switching state".

9-13. Claim 65 recites the limitation "the dynamic models" in lines 15 and 18 of the claim. For

clarification purposes, the Examiner suggests that "program code for associating each model" in

line 3 of the claim be replaced with "program code for associating each of a plurality of dynamic

models".

9-14. Claim 71 recites the limitation "the optimal controls" in line 2 of the claim. The

Examiner suggests that "the optimal controls" be replaced with "the optimal switching and

continuous state controls".

Claim Rejections - 35 USC § 101

10. 35 U.S.C. 101 reads as follows:

> Whoever invents or discovers any new and useful process, machine, manufacture, or composition of matter, or
> any new and useful improvement thereof, may obtain a patent therefor, subject to the conditions and
> requirements of this title.

11. Claims 1-74 are rejected under 35 U.S.C. 101 because the inventions as disclosed in

claims are directed to non-statutory subject matter.

11-1. Claims 1-53 appear to be directed to the manipulation of abstract ideas for synthesizing a

sequence and claims 54-74 appear to be directed to the manipulation of abstract ideas for

interpolating from a sequence. In other words, the claimed inventions are not tangibly embodied

as they recite abstract idea without reciting a concrete, useful, and tangible result. Furthermore,

claims 1-24, 29-61, and 66-74 are not tangibly embodied and not in the technological arts as they

recite abstract idea and could be practiced with pencil and paper.

11-2. Claims 28 and 65 are transitory in nature and not tangibly embodied in a manner so as to

be executable and are non-statutory for failing to be in one of the categories of invention.

Double Patenting

12.   The nonstatutory double patenting rejection is based on a judicially created doctrine

grounded in public policy (a policy reflected in the statute) so as to prevent the unjustified or

improper timewise extension of the "right to exclude" granted by a patent and to prevent possible

harassment by multiple assignees. See *In re Goodman*, 11 F.3d 1046, 29 USPQ2d 2010 (Fed.

Cir. 1993); *In re Longi*, 759 F.2d 887, 225 USPQ 645 (Fed. Cir. 1985); *In re Van Ornum*, 686

F.2d 937, 214 USPQ 761 (CCPA 1982); *In re Vogel*, 422 F.2d 438, 164 USPQ 619 (CCPA

1970);and, *In re Thorington*, 418 F.2d 528, 163 USPQ 644 (CCPA 1969).

A timely filed terminal disclaimer in compliance with 37 CFR 1.321(c) may be used to

overcome an actual or provisional rejection based on a nonstatutory double patenting ground

provided the conflicting application or patent is shown to be commonly owned with this

application. See 37 CFR 1.130(b).

Effective January 1, 1994, a registered attorney or agent of record may sign a terminal

disclaimer. A terminal disclaimer signed by the assignee must fully comply with 37

CFR 3.73(b).

13.   Claim 29 is rejected under the judicially created doctrine of obviousness-type double

patenting as being unpatentable over claim 38 of U.S. Patent No. 6,591,146 B1. Although the

conflicting claims are not identical, they are not patentably distinct from each other because

claim 38 of U.S. Patent No. 6,591,146 B1 contains every element of claim 29 of the instant

application and as such anticipates claim 29 of the instant application.

Conclusion

14.   The prior art made of record and not relied upon is considered pertinent to Applicants'

disclosure.

Reference to Yang et al., U.S. Patent 6,580,810 B1 issued June 17, 2003, and filed June

10, 1999, is cited as disclosing a method of image processing in 3-D head motion tracking.

Reference to Ghahramani, "Learning Dynamic Bayesian Networks", in Giles et al.

editors, Adaptive Processing of Temporal Information, Lecture Notes in Artificial Intelligence,

Springer-Verlag, 1997, pages 168-197, is cited as disclosing using tractable variational

approximations to learn the model parameters by maximizing the likelihood.

Reference to Boyen et al., "Tractable Inference for Complex Stochastic Processes",

Proceedings of the Fourteenth Conference on Uncertainty in Artificial Intelligence, 1998, pages

33-42, is cited as disclosing an inference algorithm utilizing compactly represented approximate

belief states.

Reference to Pavlovic et al., "Variational Learning in Mixed-State Dynamic Graphical

Models", Proceedings of the Fifteenth Conference on Uncertainty in Artificial Intelligence, 1999,

pages 522-530, is cited as disclosing a mixed-state dynamic graphical model in which a hidden

Markov model drives a linear dynamic system.

15.   Any inquiry concerning this communication or earlier communications from the

Examiner should be directed to Herng-der Day whose telephone number is (571) 272-3777. The

Examiner can normally be reached on 9:00 - 17:30. Any inquiry of a general nature or relating

to the status of this application should be directed to the TC 2100 Group receptionist: (571) 272-

2100.

        If attempts to reach the Examiner by telephone are unsuccessful, the Examiner's

supervisor, Jean R. Homere can be reached on (571) 272-3780. The fax phone numbers for the

organization where this application or proceeding is assigned is (703) 872-9306.

        Information regarding the status of an application may be obtained from the Patent

Application Information Retrieval (PAIR) system. Status information for published applications

may be obtained from either Private PAIR or Public PAIR. Status information for unpublished

applications is available through Private PAIR only. For more information about the PAIR

system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private

PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Herng-der Day 𝓗.𝓓.
March 16, 2005

JEAN R. HOMERE
PRIMARY EXAMINER